Listing of Claims

This Listing of Claims shall replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method for the removal of mercury ~~of~~ from carbonaceous fuel comprising[[:]]

a) introducing ~~any~~ a carbonaceous fuel~~; coal, coke, bio mass or combinations thereof containing,~~ that contains mercury, into a ~~first stage~~ partial oxidation ~~(gasifier)~~ unit operating at a stoichiometric air ~~or oxygen air~~ to fuel ratio of 0.40 to ~~0 0.80~~ 0.80, ~~to provide~~ providing a reducing operating condition for high levels of mercury capture in an alkaline molten fuel ash slag under reducing conditions with carbon, carbon monoxide and hydrogen as the reducing agents ~~for a~~ from partial oxidation ~~(gasifier) temperature range of 2200° F to 3000°F~~;

b) introducing an alkali ~~or any alkali or combinations thereof from the class consisting of lime, limestone, dolomite, calcium, chloride, nacholite, and trona,~~ with ~~the~~ said fuel or via a separate stream into the ~~first stage~~ partial oxidation unit, ~~the~~ said alkali ~~acting as a flux to reduce~~ reducing molten carbonaceous fuel ash viscosity and ~~to react~~ reacting with the mercury species ~~being~~ liberated from said fuel;

c) separating a fuel gas- ~~and~~ molten liquid slag ~~being separated in a first stage cyclonic device~~ following the contact of said fuel gas-molten liquid slag in the mix section ~~and~~ while under the highly reducing condition wherein a ~~said~~ molten slag mixture comprising ~~containing combinations of~~ an alkali ~~alkalis~~ and a mercury compound ~~compounds being~~ is removed to a water quench system ~~and disposed of~~.

2. (Cancelled)

3. (New) The method according to Claim 1, wherein said carbonaceous fuel is selected from the group consisting of coal, coke, biomass, and combinations thereof.

4. (New) The method according to Claim 1, wherein said slag is maintained as a reducing liquid media by performing said partial oxidation at a temperature range of 2200° F to 3000°F.

5. (New) The method according to Claim 1, wherein the alkali is limestone.

6. (New) The method according to Claim 1, wherein the alkali is a mixture of limestone and at least one member selected from the group consisting of calcium chloride, nahcolite and trona.

7. (New) The method according to Claim 1, wherein said mercury compound is captured in a mineral complex that is non-soluble in water.

8. (New) A method for the removal of mercury from carbonaceous fuel comprising

a) introducing a carbonaceous fuel that contains mercury, into a partial oxidation unit operating at a stoichiometric air to fuel ratio of 0.50 to 0.70, providing a reducing operating condition for high levels of mercury capture in an alkaline molten fuel ash slag under reducing conditions with carbon, carbon monoxide and hydrogen as the reducing agents from partial oxidation;

b) introducing an alkali with said fuel or via a separate stream into the partial oxidation unit, said alkali reducing molten carbonaceous fuel ash viscosity and reacting with the mercury species liberated from said fuel;

c) separating a fuel gas-molten liquid slag following the contact of said fuel gas-molten liquid slag in the mix section while under the highly reducing condition wherein a molten slag mixture comprising an alkali and a mercury compound is removed to a water quench system.

9. (New) The method according to Claim 7, wherein said carbonaceous fuel is selected from the group consisting of coal, coke, biomass and combinations thereof.

10. (New) The method according to Claim 7, wherein said slag is maintained as a reducing liquid media by performing said partial oxidation at a temperature range of 2200° F to 3000°F.

11. (New) The method according to Claim 7, wherein the alkali is limestone.

12. (New) The method according to Claim 7, wherein the alkali is a mixture of limestone and at least one member selected from the group consisting of calcium chloride, nahcolite and trona.

13. (New) The method according to Claim 7, wherein said mercury compound is captured in a mineral complex that is non-soluble in water.